The latter lacks illustrations, but has a soil map.

DUNGENESS FORELAND.

Dr. F. P. Gulliver continues his studies on Cuspate Forelands (Bull. Geol. Soc. Amer. VII., 1896), by a study of Dungeness foreland, on the southeastern coast of England, one of the best examples of its class; having read his paper on this subject at the Liverpool meeting of the British Association in 1896 (London Geogr. Journ. IX., 1897, 536–546). He gives a restoration of the initial shore line of the region, and outlines of successive stages in the growth of the foreland, whose cusp has grown eastward and outward during its enlargement. It now projects about ten miles into the channel from the original reentrant of the coast; near the apex the shingle ridges or 'fulls' indicate the lines of progressive growth with much clearness. It is noted that English sailors have recognized forms in other parts of the world similar to this home example, and have applied the home name to two widely separated forelands; one in Puget Sound, the other in the Strait of Magellan.

A FAULT LINE IN AFGHANISTAN

An account of the southern borderland of Afghanistan by Captain McMahon (London Geogr. Journ., IX., 1897, 392–415) includes a description of a remarkable fault line, along which the topography of a growing displacement is visible. It was examined for a distance of 120 miles, on an almost direct course a little east of north, near the southeastern corner of Afghanistan; a well defined broad line of deep indentation, in many places as distinct as a deep railway cutting. It ran for a time along the border of the Registan plains, then obliquely traversed two mountain ranges, cutting the crest of one near its highest peak. Springs are common along it, and for this reason as well as because it forms a short cut across mountain spurs, the depression is commonly used as a thoroughfare. Igneous rocks form the country to the west, and sedimentaries lie to the east of the fault line. During the lifetime of the older natives, on the occasion of three severe earthquakes, deep fissures appeared along the depression, and the springs increased in volume. The line crosses a frontier railway near Chaman, beyond Quetta. A severe earthquake on December 20, 1892, opened a fissure where the fault crossed the track, distorting the rails, and lessening the distance between Quetta and Chaman by $2\frac{1}{2}$ feet. All the region is desert—bold, barren mountains, stony slopes, shifting dunes, alluvial and saline plains; many camels died in McMahon's trip across it.

W. M. Davis.

Harvard University.

SCIENTIFIC NOTES AND NEWS.

Professor Alfred M. Mayer, the eminent physicist, died at Maplewood, N. J., on July 13th, aged sixty-one years.

On the recommendation of Hon. Chas. D. Walcott, acting Assistant Secretary of the Smithsonian Institution, in charge of the U. S. National Museum, an important change has been made in the administration of the Museum. Three sections have been organized—a section of anthropology, a section of biology and a section of geology, each having a head curator with an annual salary of $3,500. Dr. W. H. Holmes has been appointed head curator of anthropology; Dr. Frederick W. True, head curator of biology, and Dr. George P. Merrill, head curator of geology. Dr. True and Dr. Merrill are already connected with the Museum, and it is expected that Dr. True will continue to act as the executive curator. Dr. Holmes leaves the Field Columbian Museum, Chicago, to accept this position, but was formerly connected with the U. S. Geological Survey and the Bureau of Ethnology.

The Berlin Academy of Sciences made, at its last meeting, awards for scientific purposes

amounting to nearly $20,000. These awards were as follows: To Professor F. E. Schültze for the publication of *Das Tierreich* under the auspices of the Zoological Society, 35,000 M.; for the publication of the new edition of Kant's works, 25,000 M.; to Professor Engler for the publication of monographs on African botany, 2,000 M.; to Dr. G. Lindau for studies on Lichens, 900 M.; to Professor F. Frech for his geological studies, 1,500 M.; to Professor H. Hürthle for studies on muscles, 850 M.; to Professor R. Bonnet, for the preparation of a work on blood vessels, 800 M.; to Dr. Lühe, for investigations of the fauna of salt lakes of North Africa, 2,000 M.; to Dr. G. Brandes, for studies on Nemertina, 300 M.; to Dr. R. Hesse for investigations at Naples on the eyes of lower marine animals, 500 M.; to Professor E. Cohen for investigations of meteorites, 1,500 M., and to Dr. L. Wulff for experiments on artificial crystals, 1,500 M.

THE Academy of Sciences of Vienna celebrated, on May 30th, the fiftieth anniversary of its foundation. The government made this the occasion of increasing the annual subsidy of the Academy from 40,000 to 50,000 Fl.

THE German Zoological Society held its seventh annual meeting from the 9th to the 11th of June at Kiel. We learn from *Die Natur* that the program we have already announced was carried out, except that the president, Professor Bütschli, was unable to be present and the meeting was presided over by Professor J. B. Carus. There were thirty-seven members and thirteen guests in attendance. It was decided to hold the next annual meeting at Heidelberg at Whitsuntide.

THE eightieth meeting of the Swiss Scientific Association will be held at Engelberg from the 12th to the 15th of September. The place of meeting is in the midst of fine Alpine scenery a three and a-half hours' drive from the nearest railway station. American men of science are cordially invited to be present.

THE Anatomical Society, intended to be international in character, but chiefly supported by German anatomists, held its eleventh meeting at Genth from the 24th to the 27th of April, with fifty members and guests in attendance. The President, Professor Waldeyer, discussed anatomical nomenclature, and papers were presented by Professor O. Schültze, Professor v. Kölliker, Professor v. Bardeleben and others. The next meeting will be held at Kiel during April of next year.

THE preliminary program of the first International Congress of Mathematicians, to be held at Zurich from the 9th to the 11th of August, announces that in addition to two general meetings there will be six sectional meetings as follows: Arithmetic and algebra, analysis and theory of functions, geometry, mechanics and mathematical physics, astronomy and geodesy, history and bibliography. At the general sessions the following papers will be presented: 'On the relations between pure analysis and mathematical physics,' by Professor H. Poincaré; 'On the recent development of the general theory of analytical functions,' by Professor A. Huritz; 'On the teaching of higher mathematics,' by Professor F. Klein; On *Logica Mathematica*, by Professor G. Peano. The dues for the Congress are 25 fr., which sum includes the cost of the banquet and other entertainments.

THE second of the annual conversaziones of the Royal Society was held on June 16th. Demonstrations with illustrations were made by Mr. W. H. Preece on signalling through space without wires, and by Professor Lockyer on the arrangements of the 1896 eclipse expeditions. There were exhibits by Lord Kelvin of the electrical effects of uranium and of X-rays, by Professor S. P. Thompson, Mr. A. A. C. Swinton, Dr. John Macintyre, Dr. J. H. Gladstone and Mr. Walter Hibbert. There were also other interesting exhibits, both in the biological and in the physical sciences.

THE annual field meeting of the Indiana Academy of Science was held at Lafayette from the 26th to the 28th of May, with an attendance of forty members. Excursions were made in the surrounding regions, and an address was given by Professor Frederick Starr, his subject being 'Dress and Ornament.'

PROFESSOR A. C. GREENHILL, of Woolwich; Professor J. V. Jones, of Cardiff, and Professors John Perry and W. E. Ayrton, of London, have expressed their intention of being present at

the Detroit meeting of the A.A.A.S. and participating in the proceedings of the section for physics.

THE Albert medal of the Society of Arts, London, has been awarded to Mr. G. J. Symons for his services to meteorology.

THE Senckenberg Society of Natural History at Frankfort has awarded the Sommering prize, consisting of a medal and 500 M., to Professor Gustav Born, of Breslau, for his researches on the growth of the larvæ of amphibia.

THE death is announced of Dr. P. Schützenberger, professor of chemistry at the Collège de France, at the age of sixty-seven years. He had been since 1888 member of the Paris Academy of Sciences and had made important contributions to organic chemistry.

WE also regret to announce the following deaths: Dr. Alfred Moquart, professor of anatomy at Brussels, on June 5th; Professor Martin Wilckens, of the Agricultural School of Vienna, on June 10th, at the age of sixty-four years; Count Victor Trevisan di S. Leon, the cryptogamist, in Milan, on April 8th, and Frau Dr. Vera Bogdanowskaja-Popoff, on May 8th, as the result of an explosion while carrying on chemical experiments.

DURING the Moscow meeting of the International Medical Congress a statue to the eminent surgeon Pirogof will be unveiled. The sum of 12,000 roubles (about $6,000) has been collected by public subscription for the statue, the sculptor of which is Mr. V. R. Sherwood.

M. HATT and Professor de Lapparent have been elected members of the Paris Academy of Sciences.

MR. F. D. GODMAN has been elected President of the British Ornithologists' Union.

PROFESSOR P. ROUSSELOT, of the École des Hautes Études, Paris, has been appointed director of the laboratory for experimental phonetics, the establishment of which under the Collège de France we recently announced.

MR. HENRY L. BRYAN has been appointed, by the trustees of the Philadelphia Commercial Museum, Secretary of the Museum.

THE U. S. Civil Service Commission announces a competitive examination, on August 9th, for the purpose of establishing a register from which certification may be made to the position of Examiner, Mint Bureau, Treasury Department, at a salary of $2,500 per annum. The duties of the position comprise the inspection and supervision of all the machinery installed in different U. S. mints throughout the country. Applicants should be graduates of recognized technical schools giving courses in mechanical engineering, or should, in lieu of this, have very broad training and experience along the lines of mechanical engineering.

PRESIDENT JORDAN has passed through Seattle on his way to Alaska. He is accompanied by Professor Wood, of Stanford University.

MR. H. W. TURNER, of the U. S. Geological Survey, and Professor John C. Branner, of Stanford University, are engaged in exploring in the region of the Yosemite and Hetch-hetchy Valleys and the adjacent mountains.

MR. R. W. PORTER and Mr. A. V. Shand, who are accompanying Lieut. Peary on his present expedition, expect to spend the winter in Baffin Land making ethnological and zoological studies and collections. They expect, in the summer of 1898, to explore the country northward and to return on a whaling ship from Cumberland Sound to Aberdeen.

THE men of science who will embark on the 'Belgica' on its approaching expedition to the Antarctic regions will be as follows: The captain, M. A. de Gerlache, geology, meteorology and oceanography; M. Arctowski, terrestrial magnetism and physics; M. Danes, zoology, and M. Racovitza. The crew have already embarked in Norway and it is expected that the steamship will leave Antwerp on the 25th of the present month. The men of science expect to spend the Antarctic winter in Victoria Land, while the steamship will go to Melbourne to renew its stores.

PROFESSOR F. A. STARR has returned to the University of Chicago, from an expedition to New Mexico, having explored one of the mesas and one of the caves of the Cochitas, and having secured plaster casts of the busts of a number of Pueblo Indians.

THE Canadian Pacific Railway Company will sell first-class return tickets to members of the British Association from Toronto to the Pacific Coast, at a rate varying between $61.80 and $70.30, according to the route selected. This is less than a single fare and the tickets are available from July 1st to October 1st.

DARWIN'S family have presented to Cambridge University the geological specimens found during the voyage of the 'Beagle' and a series of slides used in the preparation of his monograph on the Cirripedia. The former has been placed in the Museum of Geology, the latter in the Museum of Zoology.

IN celebration of the Cabot quatercentenary the foundation stone of a memorial tower to be erected on Brandon Hill, Bristol, was laid on June 25th. The tower will be 100 feet in height, squarely built with emblematic panels. Some of the bas-reliefs will be contributed by an American committee, the President of which is Mr. Bayard, lately Ambassador to Great Britain. Lord Dufferin made a speech describing what little is known of Cabot and the adventurous voyage of the 'Matthew' and its importance for the extension of Anglo-Saxon civilization.

THE Geological Society of Portugal opened on July 8th the new Geographical Institute founded at Lisbon in commemoration of the 400th anniversary of Vasco da Gama's departure for the Indies.

THE Academy of Medicine of Paris has received a legacy of 15,000 fr. from Mme. Clarens for the foundation of an annual prize.

THE scientific library of the late Sir G. Humphrey, professor of surgery at Cambridge, has been presented by Mrs. Humphrey to the surgical department of the University.

THE town of Middletown, N. Y., receives, by the will of the late Mrs. S. Maretta Thrall, $30,000 for a public library. She had already given the town a hospital and a park, the value of her gifts aggregating $80,000.

THE Board of Education of the City of New York has adopted a resolution providing for the employment of oculists to report upon the best colors to be used in painting and decorating schoolrooms with reference to their effects on the eyesight of children.

REPRESENTATIVE LACEY, of Iowa, has introduced a bill in the House of Representatives providing that the name of the Fish Commission shall be changed to the Commission of Fish, Fisheries and Birds. It is proposed that the Commission shall extend its jurisdiction to provide for the propagation, distribution and restoration of game and other wild birds of the United States. It is not likely that this change will be made, as wild birds and mammals are already provided for under the Department of Agriculture, and any extension of the work should be developed under that Department.

BEGINNING with the number for July, the *Physical Review* will be published by the Macmillan Company in two volumes annually. These volumes will begin in January and July respectively, and will each contain about five numbers.

Natural Science for July, now published by J. M. Dent & Co., and printed by Turnbull & Spears with improved typography and better paper, contains articles by Professor Bashford Dean on the Hopkins Seaside Laboratory of Stanford University, and by Dr. P. L. Sclater on 'The Proposed Zoological Park in New York.' *Natural Science* should have given credit to *Nature* for the queer note to the effect that Professor Putnam and Dr. Boas have started on a six years' expedition to study the relation of the American Races to those of Asia and Africa. "They will proceed up the northwest coast of North America, cross Behring Strait, and so pass down through eastern Siberia into China, and thence along the Indian Ocean to Egypt."

THE presidential address by Dr. G. W. Hill before the American Mathematical Society in 1895, printed in the issue of this JOURNAL for March 6, 1896, is published in the current number of the *Revue Scientifique*. It is credited as a presidential address before *l'Association scientifique americaine*.

PROFESSOR RÖNTGEN has contributed to the *Berichte* of the Berlin Academy an account of further observations on the properties of the X-rays. He has observed that the rays emanate from the irradiated air in all directions so

that if the rays were visible the appearance would be that of a room filled with smoke and lighted up by a candle. When a plate impervious to the rays is placed between a fluorescent screen and a source of the rays the platinocyanide of barium nevertheless becomes luminous, and this luminosity is visible even when the screen lies directly upon the plate. If, however, the screen placed on the plate is covered by a cylinder of lead 0.1 cm. in thickness surrounding the fluorescent screen the fluorescence disappears. Professor Röntgen has further been able to measure the intensity of the rays and to study the influences on which this depends. Dr. Brandes' observations that the X-rays may be made visible, presumably by causing fluorescence of the retina, are confirmed. Professor Röntgen sums up the present state of our knowledge in regard to the rays as follows: (1) The rays proceeding from the discharging apparatus are a mixture of rays varyin absorbability and intensity. (2) The composition depends chiefly on the duration of the discharging current. (3) Different bodies absorb different kinds of rays. (4) The X-rays are produced by the cathode rays and the phenomena of both are probably of the same nature.

The compilation of the statistics of coal production in the United States in 1896, which has just been completed by Statistician E. W. Parker, of the U. S. Geological Survey, shows that the product in 1896 was 190,639,959 short tons, valued at $195,557,649, against 193,117,530 short tons, valued at $197,799,043 in 1895, a decrease of 2,477,571 short tons in amount, and of $2,241,394 in value. The decrease in product was entirely in that of Pennsylvania anthracite. The output of bituminous coal shows an increase of about one and three-quarters million tons. The anthracite product of Pennsylvania decreased nearly four and a quarter million tons. It is a notable feature, however, that there was a decrease in the value of the bituminous product of over $1,600,000, notwithstanding the increased output, and that there was a comparative increase in the value of anthracite, although, on account of the smaller production, it did not equal the value in 1895. The average price obtained for anthracite at the mines increased from $1.41 in 1895 to $1.51 in 1896. The average price for bituminous declined from 86 cents to 83 cents.

At the coming International Leprosy Conference, to be held in Berlin on October 11th, Dr. Hutchinson, of London, will report on alimentation and leprosy; Professor Virchow on the pathological anatomy of leprosy; Dr. Neisser, of Breslau, on its origin; Dr. Bernier, of Paris, on its etiology, and Professor Koch will discuss the question of its infectiousness.

We learn from *Natural Science* that the Natural History Museum of Halifax, which was handed over to the County Borough Council about eighteen months ago by the Literary and Philosophical Society, has now found a permanent home in the old mansion named Belle Vue. The geological and botanical collections are very extensive and valuable, but zoology is as yet very imperfectly represented. The herbarium has lately been much enriched by the fine Gibson collection of British plants, the gift of Lady Trevelyan. The Curator, Mr. Arthur Crabtree, is making an attempt to render the Museum of general educational value by adequate labelling, and wishes to secure a competent committee of management to direct and second his efforts.

UNIVERSITY AND EDUCATIONAL NEWS.

The Supreme Court of New York State issued on July 6th its final decision in the Fayerweather will case. The executors were required to distribute within ten days the three million dollars in question to the twenty colleges to which they were bequeathed.

The only colleges so far as we have noticed which have this year given the Ph. D. degree *causa honoris* are Union, Dartmouth and Tufts. These colleges have acted unwisely and Union College, as we understand it, illegally.

Professor William A. Rogers, who recently accepted the Babcock professorship of physics in Alfred University at Alfred, N. Y., delivered the principal address at the laying of the corner-stone of the Babcock Hall of Physics at Alfred on June 22d. The hall is named after the late George H. Babcock, of Plainfield, N. J., who left $100,000 to Alfred University.